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Therapeutic benefits of body percussion using the BAPNE method

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Abstract

Body percussion using to the BAPNE method is a means of cognitive stimulation with multiple applications. The aim of this research is to assess their full potential as a source of therapy. The methodology used is theoretical in nature and makes use of a wide bibliography to find evidence for its therapeutic effect. In essence, body percussion can be seen to lead to improvements in three areas. the Physical, as it stimulates awareness of the body, control of movement and muscular strength, coordination and balance; the Mental, as it improves concentration, memory and perception; and finally Socio-affective, as it helps to build egalitarian relationships and leads to a decrease in anxiety in social interactions. This means of therapy has several different uses and it is targeted at different groups. In the present investigation we categorise them into five main groups: individuals with neurodegenerative diseases like Alzheimer's or Parkinson's disease; individuals with learning disorders such as dyslexia or ADHD; patients affected by diseases of the spinal cord, cranial neuropathies and trauma (Neurorehabilitation); and for the treatment of addictive behavior (addiction); and depressive disorders or anxiety disorders.After thorough analysis, we have found scientific evidence that the therapeutic body percussion using the BAPNE method improves the quality of life of patients and it is an important factor in stabilizing the development of different diseases.In addition, evidence involving certain biological indicators (in control and experimental groups, and through a pre-test and post-test) show its effect on levels of stress and anxiety (reduction of cortisol), as well as improvement of social relations as a result of working as a group (increased levels of oxytocin), and improvements seen in self-esteem and in a variety of personal aspects through the Aspects of Identity questionnaire.

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1. Introduction

Body percussion using the BAPNE method is based on cognitive stimulation for various uses. BAPNE originally came about as a project based around pedagogy and therapy which aimed to develop the multiple intelligences through body percussion. The methodology is based on the use of different disciplines: Biomechanics, Anatomy, Psychology, Neuroscience and Ethnomusicology. It aims to develop each of the eight intelligences put forward by Gardner (1983). One of the key strengths of the methodology it is use as a means of therapy, as it has been seen to be effective in treatment of various types of illness (Romero Naranjo A, 2013). In this article, we concentrate upon the psychological aspects of this methodology and analyse its therapeutic benefits.

Practising body percussion brings about improvements in three areas: the Physical, as it stimulates awareness of the body, control of movement and muscular strength, coordination and balance; the Mental, as it improves concentration, memory and perception; and finally Socio-affective, as it helps to build egalitarian relationships and leads to a decrease in anxiety in social interactions. These three areas have a positive impact on psychological variables such as self-esteem, communication, and isolation in various different degenerative illnesses such as, for instance, Alzheimer's, depression and/or anxiety.

Overall, therapeutic body percussion (TBP) within the framework of the BAPNE method is a combination of music therapy and dance therapy. From the field of music therapy, it makes use of the link between music and emotion through the use of song, melody and percussion. From the field of dance therapy, it takes the link between movement and emotion, making use of dance, movement and choreographed routines. There is an extensive bibliography in both fields, within the framework of the creative therapies which emerged in the mid-20th century. There are a wide range of studies which prove and explain, based on current scientific knowledge, the benefits of music (Jauset, 2013) and dance for human health.

TBP, through its use of rhythm and the body itself as a musical instrument, aims to integrate music and movement in a new setting which links emotion with social relationships. This is because within the working methodology itself, the functional dynamics are highly interactive, whether groupings are in the form of a circle, concentric circles, semicircles, quartets, sextets, pairs, or in lines. With rhythm at its core, the various different types of interaction and physical contact needed to perform many of the exercises mean that body percussion can become a therapeutic tool of great importance. It is important to remember the impact and stimulation that are produced in various cortical and subcortical areas on both hemispheres of the brain due to the interaction between the different elements on which the BAPNE method is based; movement has an impact upon the motor cortex as well as the cerebellum and the basal ganglia; song effectively stimulates the right hemisphere and, through body percussion, various cognitive aspects are worked upon, such as attention and memory, thus stimulating a variety of different areas. In particular, the attention levels seen during the learning process of the various different movements lead to an increased level of blood flow in the pulvinar nuclei (thalamus), the basal ganglia, the frontal, insular, and posterior parietal cortices, as well as the nuclei of the anterior cingulate cortex. However, it is important not to forget the emotional aspects and their impact. Whilst performing the exercises in question, the emotions produced act as a source of support and motivation, which help to improve the cognitive work which is being carried out.

The proposed methodology is based on putting forward strategies using music and movement to improve the quality of life of individuals affected by various illnesses, reducing the deficits produced and helping to stabilise the illness. Through body percussion using the BAPNE method, we include resources which act as tools to help individuals' overall health which, according to the definition proposed by the World Health Organisation, is "…a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." The improvements achieved by using the BAPNE method affect the physical, mental and socio-affective areas and, therefore, constitutes overall improvement in health.

2. Method

A theoretical review has been carried out by means of research into the extant publications on body percussion. After analysis of this bibliography, the therapeutic basis for the proposed project has been set out using different exercises for different illnesses, linking body percussion and therapy. In this way, various activities have been established which respond to the specific demands of each one of the different mental illnesses under study.

Therapeutic body percussion using the BAPNE method has at its core three main elements: rhythm, body percussion through the body, and contact, as well as song, as a means of social interaction.

2.1. Rhythm

Rhythm is at the very centre of body percussion. In a general sense, it can be defined as a controlled flow of movement, capable of ordering different elements (Carvajal Pérez, 2008). Rhythm is fundamental to our lives, as can be seen in the clear examples of breathing and heart rate. There are also other biological functions which follow specific rhythms and which are controlled by the hypothalamus, a very important gland which coordinates the endocrine system and regulates all the hormonal cycles in our bodies. This internal body clock is "adjusted" or "synchronised" with the rhythms around it, through light captured by our retina.

Rhythm is thus something inherent within our biology, to such an extent that recent studies suggest that when performing rhythmic movements to the beat of a piece of music, our body uses less oxygen (Bacon, 2012). However, it is also found in music. In this case, rhythm refers to the pattern of repetition at regular intervals, and occasionally irregular intervals, of strong and weak, long and short, sounds in a piece of music. Musical rhythm encompasses everything related to movement which controls music in time. As Jauset (2013) points out, "… exposure to rhythmic sequences has been seen to activate crucial areas for body movement, such as premotor and motor areas, the cerebellum and the basal ganglia…". The first studies which related the functional connections between the auditory and motor systems emerged in the seventies. Rossignol& Jones (1976) described how sound was able to excite spinal motor neurones through the audio-motor connections in the brainstem and spinal cord. Some years late, they were able to carry out a more detailed analysis of the connections between the primary and secondary auditory areas and the motor cortex. We now know that planning of movement is carried out in the prefrontal cortex. This area is connected to other cortical areas, which allows it to access the information needed to decide as to the planned aims. Thus, it extracts information from the parietal cortex (Brodmann areas 5 and 7) about the spatial organisation of its surroundings and the movement of objects. From Brodmann areas 2 and 3, it obtains information about the body itself and, finally, the temporal cortex supplies it with the necessary information about nearby objects, their context, and their relation to recent experiences stored in the memory.

In short, all of this information supplies the individual with knowledge of his or her own body, and his or her surroundings. Within the framework of body percussion in the BAPNE method, rhythm is the dynamic principle which guides the psychomotor processes which are carried out when hitting the body as an instrument. The sounds generated by this form of percussion interact, through the auditory system, with all of the aforementioned areas. Thus the system feeds back into itself. This auditory-motor feedback mechanism, by which auditory information leads to motor action, primarily by means of the reticulospinal pathway, seems to be functional in neurodegenerative diseases such as Parkinson's, Huntington's disease, ictus and patients with brain damage. Furthermore, it has been seen that patients affected by Parkinson's, when stimulated with rhythmic sounds, experience increased cerebellum activity through the cerebellar-parietal-premotor cortex pathway. This could mean that there is an alternative pathway to compensate for the damage in the pathway between the basal ganglia, supplementary motor cortex and prefrontal cortex seen in Parkinson's sufferers. Thus certain methods which work with a variety of different stimuli (such as the BAPNE method) can be seen to be important and effective as they make use of various practices inherent to movement, song and body percussion.

2.2. Body percussion

The human body and voice have been, since man first appeared on earth, our main musical instruments. In his quest for different sounds, primitive man discovered that he could also express his own feelings through his body and his voice. In this way, all instruments can be seen to be an extension of the body itself. The voice and sounds produced through it, whether melodic or not – such as murmurs, howls, shouts, speech, noises, guttural effects etc. – are a result of this quest to express emotions and feelings externally. If we also consider the use of different parts of the body, such as the feet and hands, we can see there is a series of sounds that can be produced through body percussion. As Aznar Sánchez (2000, p.261) points out: "to all these bodily sounds, we can add the use of hands,

feet and limbs, which produce different forms of body percussion which help to understand and evaluate man's possibilities, especially if we bear in mind that popular games and dances can be found in many countries and are used by children from a very early age."

Our body is a musical instrument and, although we can use any part of it, the most commonly used parts are the hands, feet, thighs, knees and chest. The basic movements include handclaps, taps with the feet, finger snaps and beating different parts of the body. As Romero Naranjo (2000, p.179, vol. 2) points out, "the human body can carry out a series of basic sounds… On the upper body, we can perform the clap to the front, clap to the back, finger snaps, and beat the chest and stomach. On the lower body, we can slap our thighs, buttocks and feet". However, body percussion using the BAPNE method goes further, as it includes sounds "beats on one's own body, on someone else's body, and using other objects, such as chairs, sticks, cones, tins, tables, brooms, pieces of paper, etc" and uses body movements such as clapping, using the mouth to produce sounds, whistling, clicking fingers, arms and hands, and makes use of the thighs, chest, feet, fingers and other parts of our body.

Percussion, throughout history, has been used as a tool which shapes life in society and has had various different functions: it has been ritual and symbolic, used in work songs, children's coordination games, as means of cultural expression, as a show, and as a means of social expression. In itself, percussion takes us back to our basic instincts; it invites us to take action and to express our emotions, as it reflects our inner feelings. Just as Buades and Rodríguez state in their article "Música y salud" ('Music and health'), "changes in the way movement is carried out can lead to changes in the psyche, promoting physical and emotional health". From this assertion, we can gather that it is a way of having an effect on the mental through the physical. For this reason, we suggest that performing body percussion generates bodily and emotional states which are able to lead to significant behavioural changes in different mental illnesses.

2.3. Contact and song as social interaction

One of the unique features of the BAPNE method is the large number of social interactions that it generates. This type of interaction is produced by means of contact with one another. Many of these interactions are physical, by means of beats carried out on someone else's body, whilst others are simply visual, forming part of a coordinated movement. In this way, from a bioenergetics perspective, there are three main ways of bodies being made stable: through eye contact, through hands, and through feet (Lowen, 1985; Reich, 2005). Though in this context, bodies being stable is related to an ability to register the state of one's own body and being able to stand firmly on the ground with two feed, feeling anchored and rooted, these other three forms are the way in which contact is established with one another.

Contact is beneficial and an essential element of our human nature. It is one of the main psychological needs of human beings. This need responds to the principle of union and separation, by which each person relates to the outside world individually and shares and exchanges emotions, ideas and food (Martin, 2006). Humans connect with and disconnect from their surroundings constantly. In a period of contact (union), I talk to you, I touch you and I listen to you, to then go on and move away and be alone (separation). As Eving and Miriam Polster (1973, p.129) point out, contact is charged with excitement which exists within the subject, which peaks in a sense of commitment to whatever is the overriding interest at that moment.

However, it is important to point out that not everyone responds to contact in the same way. It will depend on the capacity of each person to be in contact with their own feelings (i.e. their sense of resonance) as to whether a person makes contact in certain events or denies them importance when faced with apparently comparable occurrences. Each person has a vital space, an imaginary territorial space which we use to define the quantity, quality, and time of contact, and the degree of physical proximity with the other person (Martin, 2006). When a person stays in this territorial space, out of fear, they run the risk of reducing the degree of contact with other people, which translates into a deep sense of isolation. If, on the other hand, they are overly extrovert, they lose the limits of themselves, and thus dissolve the difference between their surroundings and their person, and become hooked on this relationship. For this reason, contact can only occur between separate people if there is the necessary balance between contact and distance. Although contact can be dangerous if we lose ourselves in the other person, it is the foundation of growth and change.

> "Only in my relation and contact with other people can my experience and your experience relate to each other and can our worlds change, whether this is through an interchange of experiences or carrying out something together. Change is the necessary product of contact. Through contact, a type of learning occurs which stems from the interchange of experiences, of what you think and what you feel, and of what I think and what I feel" (Martin, 2006, p.64)

Eye contact is a form of contact, just as singing, listening and touch are. To see is, in essence, to be touched by light. Opening one's eyes is introducing oneself as a being and is also learning to be seen. Eye movements and flow are natural activities for the eye for good perception, something which therapeutic body percussion (TBP) fosters. In a wide range of exercises, continuous eye movement is essential as part of coordinated movement, as it favours perception and eye contact with others. Listening is, in essence, to be touched by sound waves in the basilar membrane which simultaneously activates the premotor and motor areas that have already been mentioned. Despite what one might think, listening is an open and very active process. TBP stimulates this sense, in question-response exercises that are based on verbal and psychomotor structures in which patients have to repeat a rhythmic patter in unison, or repeat melodies. Touch is the most direct form of contact. Hitting, caressing, hugging and clapping are some of the most obvious ways of reaching the other person. The immediacy of touch crosses intellectual boundaries and is a way of generating concrete moments of self-awareness (Eving y Miriam Polster, 1973).

TBP in the BAPNE method constantly invites physical contact through handclaps, touching hands or coordinated movements that require contact. However, TBP goes one step further as it uses these forms of contact through movement, which in itself can facilitate contact, both internal, through sensations, and external, through an increase in trust by means of contact with another person. These forms of contact in movement, as can be seen in singing, have a very important role in facilitating social links. In fact, TBP is characterised by its use of group work, as its basic form of learning is social or communitarian. These forms include work in a circle, concentric circles, semicircles, quartets, sextets, octets, pairs, two lines with sideways movement, or two lines with movement towards each other. Working in a circle is a way of promoting inclusive forms of working and stimulating communication skills. Working in two concentric circles offers up forms of social interaction where there are no hierarchies and everyone relates with one another. Singing and sounding out a melody in unison generates a sense of creating pleasant sounds, as well as being beneficial to the cerebral, cardiovascular and pulmonary systems. It works on the right hemisphere – important and effective for those people who suffer Broca's aphasia -, it increases the secretion of oxytocin, a hormone linked to establishing and recognising social relationships (especially in the formation of relationships of trust and generosity) and reduces levels of cortisone (a hormone produced by the suprarenal glands in response to stressful situations) and thus decreases levels of stress and favours appropriate group dynamics which benefit all participants.

This type of group dynamic promotes the development of social relationships based around support and personal trust, the active participation of group members and the development of solid links between the group.

At the same time, body percussion itself is a form of expression by which the body talks, where we express, where we open ourselves up to be known by others. For all these reasons, TBP promotes intervention at a relational level, that is to say, in the way in which people relate to one another. It is a form of learning which shows a different form of relationship and thus a different pattern of linking. When we speak of 're-establishing the link', we are referring precisely to a change in this sense, in the normal patterns of relationships between people. TBP promotes a relational pattern which includes physical contact, equality, trust, support and greater expression. Therefore, the most important thing in working with TBP is not for the exercise to be successful musically, but that it is successful in the communitarian and emotional dimension which these exercises implicitly work on. In these exercises, there are no forms of hierarchy, but inclusive learning.

3. Conclusions

We would therefore argue, in light of the research explored, that practising body percussion can lead to improvement in three areas: Physical, as it stimulates awareness of the body, control of movement and muscular strength, coordination and balance; the Mental, as it improves concentration, memory and perception; and Socio-affective, as it helps to build egalitarian relationships and leads to a decrease in anxiety in social interactions. These

three areas have a positive impact on psychological variables such as self-esteem, communication, and isolation in various different degenerative illnesses such as, for instance, Alzheimer's, depression and/or anxiety. We can, therefore, summarise the most important points as:

- Providing therapeutic body percussion (TBP) with a theoretical corpus
- Establishing specific exercises for each illness so as they can be most effective
- Improving the quality of life of patients by stabilising their illnesses
- Developing self-expression
- Stimulating the quality of social interactions and personal development of patients
- Improving self-esteem and bodily self-image
- Maximising social and communication skills

Our proposal is based on research into specific exercises for each type of illness and on sequencing activities to the specific needs of each psychopathological deficit. We therefore now set out guidelines accordingly, bearing in mind the neurological basis of the different actions involved in the BAPNE method.

- For individuals with mild cognitive deficit, we propose activities which promote attention (sustained, divided, focused and selective) and activities which foster short- and long-term memory (procedural memory).
- For individuals with Parkinson's, who exhibit reduced bradykinesia, we propose activities to improve motor control (both inferior and superior), as well as coordination and dissociation.
- For individuals with Alzheimer's, who commonly have high cortisol levels, we propose activities involving movement linked to melody
- For individuals with depression, we propose activities in a circle, working as a group, with a lot of contact, in which we foster a sense of belonging to a group, whilst singing and following a rhythm in unison. This type of activity fosters a feeling of security and trust in a group and avoids any risk of competition.

Finally, so that TBP can be established in the field of therapy, it is vitally important to design experiments (both qualitative and quantitative) which offer up ways of measuring cognitive function, such as attention, concentration, memory, as well as biological functions (cortisol levels and oxytocin levels), and more psychological levels such as identity in its four dimensions (personal, relational, social and collective) and self-esteem, for instance. For this reason, it will be necessary to develop evaluation instruments, questionnaires, tests, observation scales, to select significant indicators, and to elaborate hypotheses, which will all need to be particular to each type of disorder. Through instigation and development on the empirical field, we will guarantee a promising future for this new discipline.

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